U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

1200 New Jersey Avenue SE
Washington, DC 20590

FEB 12 2008

Mr. Kenneth N. Weinstein
Mayer Brown LLP
1909 K Street, N.W.
Washington, DC 20006-1101

Dear Mr. Weinstein:

This letter is in response to your letter dated February 4, 2008, concerning the Office of Defects Investigation's (ODI) investigation into the power liftgates on certain model year 2004-2007 Toyota Sienna vehicles. In your letter, you requested the test results and test protocols related to testing conducted by the Vehicle Research and Test Center (VRTC) and more information on the injury claims that were referenced in my January 25, 2008, letter to Mr. Chris Tinto of Toyota Motor North America, Inc. (Toyota).

Enclosed are VRTC's test protocols and test results that provide the basis for my January 25 letter. With respect to your second request, on February 1, ODI e-mailed to Mr. Chris Santucci of Toyota additional information regarding the injury claims.

In addition, I should inform you that Toyota's plan, according to Mr. Tinto, to issue an extended warranty program that would cover failed liftgate struts in the subject vehicles instead of issuing a safety recall campaign, is not an adequate remedy for the alleged defect explained in my January 25 letter.

In a telephone call to me, you indicated that Toyota would need additional time to respond to my January 25 letter. Your request is granted and the due date for responding to that letter is February 22, 2008.

Sincerely,

Kathleen C. DeMeter, Director
Office of Defects Investigation
Office of Enforcement

Enclosures

Test Protocol
Toyota Sienna Liftgate Struts
EA06-020

1.0 Procurement of Test Items

1.1 Procure one new exemplar liftgate strut
1.2 Procure complaint struts as available
1.3 Procure one exemplar vehicle

2.0 Determine Force to Support Liftgate and Distance from Striker to Floor at Various Angles

2.1 Fabricate rigid support devices that will support the liftgate at the fully open position as well as at 15°, 30°, and 45° down from fully open.
- The support devices must be capable of having a load cell attached to measure the load exerted by the liftgate on the support device.
- The ends of the support devices must be designed so that they attach to the ball studs on the test vehicle in the same manner as the liftgate struts are attached to the ball studs during normal operation.

2.2 Remove the gas struts from the test vehicle and replace them with the support devices.
2.3 Measure the static force exerted by the liftgate at the positions listed in paragraph 2.1.
2.4 Measure the distance from the latch striker to the floor at the positions listed in paragraph 2.1.

3.0 Determine Strut Forces Where "Slow Drop" and "Initial Fast Drop" Occur

3.1 Measure the compression force of each strut as follows.
- 3.1.1 Install each strut, in turn, in a Tensile Test machine.
- 3.1.2 Compress the strut at a rate of 20 in/min. while continuously recording the force exerted by the strut.
- 3.1.3 Test each strut three times at each of the following three conditions: after a three hour soak at room temperature (72° F), three hours at 115° F in an oven, and three hours at 35° F in an ice bath. Only one test is to be conducted on a given strut per soak period.

3.2 Using different combinations of the available complaint struts at room temperature, determine the following:
- 3.2.1 Minimum strut force that will support the liftgate in the fully open position with no downward movement.
- 3.2.2 Minimum strut force that will allow the liftgate to drop slowly without engaging the drive motor. Note: Below this minimum force, the liftgate will drop quickly and the drive motor will engage.

4.0 Determine Force Applied by Downward Motion of Liftgate

4.1 Install a rotary potentiometer on the test vehicle that has a rotational capability of at least 180 degrees to provide for ease of mounting.

4.2 Fabricate a device that can be positioned to support a load cell in the path of the closing liftgate when the liftgate is at 10°, 30°, 50°, and 70° down from fully open.
- The device must be capable of being moved easily into position as the liftgate opens electrically.
- The device must be capable of adjusting the orientation of the load cell so that, at each test position, when the liftgate latch plate contacts the load cell, the direction of travel of the liftgate latch plate is perpendicular to the orientation of the load cell.

4.3 Install the load cell on the above-described device and secure a piece of dummy "skin" over the load cell.

4.4 Adjust the device so that the load cell is positioned perpendicular to the direction of travel of the liftgate latch plate at the point where the latch plate contacts the load cell.

4.5 Install liftgate struts to be tested onto liftgate/vehicle and close the liftgate.

4.6 Activate the electric liftgate opening motor using the liftgate open button on the key fob.

4.7 As the liftgate rises above the position of the load cell, insert the load cell device into position to obstruct the liftgate as it closes. The proper position of the device should be determined prior to testing to ensure the liftgate latch plate will contact the load cell during testing and that the direction of movement of the latch plate during contact is perpendicular to the orientation of the load cell.

4.8 Monitor and record the force exerted by the liftgate as it contacts the load cell.

4.9 Using each of the drop angles described in section 4.2, test each pair of struts after a three hour soak at room temperature (72° F) and after a three hour soak at 35° F in an ice bath. Only one test is to be performed per soak period.

Test Results
Toyota Sienna Liftgate Struts
EA06-020

2.0 Force to Support Liftgate and Distance from Striker to Floor at Various Angles

Liftgate Position (deg. down from fully open)	Force on Strut (lb)	Distance from Striker to Floor (in)
0	200	74
15	206	63
30	210	51
45	218	40

3.0 Strut Forces Where "Slow Drop" and "Initial Fast Drop" Occur

Test Results for Section 3.1

Strut ID	Exerted Force (lb)		
	110° F	72° F	35° F
A	160	147	140
B	119	113	107
C	89	84	84
D	157	147	139
E	Total Failure		
F	147	133	130
G	55	50	47
H	141	133	125
I	150	129	134

Strut A was a new strut.
Struts removed from complaint vehicles in pairs were: B and C, D and E, and F and G.
Struts H and I were the pair of struts removed from test vehicle.

Test Results for Section 3.2

Strut ID	Force at Full Compression (lb)	Force at Full Extension (lb)	Category
DF	280	226	A
DH	280	229	A
DI	276	227	A
FH	266	213	A
FI	262	211	A
HI	262	214	A
BD	260	209	A
BF	246	193	A
BH	246	196	A
BI	242	194	A
CD	231	189	A
CF	217	173	B
CH	217	176	B
CI	213	174	B
BC	197	156	B
DG	197	158	B
FG	183	142	C
GH	183	145	C
GI	179	143	C
BG	163	125	C
A	147	119	C
D	147	121	C
CG	134	105	C
F	133	105	C
H	133	108	C
I	129	106	C
B	113	88	C
C	84	68	C
G	50	37	C

Category	Description
A	Liftgate did not drop.
B	Liftgate dropped slowly without engaging motor.
C	Liftgate dropped and engaged motor.

Note: For Category C, liftgate dropped down from fully open position up to 15 degrees before motor engaged.

4.0 Force Applied by Downward Motion of Liftgate

Liftgate Closing Forces

Strut ID	Drop Angle (deg)	Closing Force (lb)	
		72° F	35° F
BC	10	0.7	145
D		214	289
FG		54	173
CG		240	279
BC	30	28	44
D		26	30
FG		24	20
CG		35	33
BC	50	N/C	39
D		51	45
FG		42	41
CG		49	39
BC	70	N/C	24
D		26	27
FG		22	28
CG		32	29

N/C = No Contact
Strut D was tested alone because strut E was totally failed.